

## Complement

The statement of Proposition 5.3 is not correct. As D. Loukianova pointed out to us, the function  $z \mapsto F(z)/z$  in the proof is not necessarily non increasing, so that this monotonicity has to be added in the assumptions of Proposition 5.3. This point only concerns the sentence (3) implies (2).

Complements in all dimensions are contained in our paper “Hitting times, functional inequalities, Lyapunov conditions and uniform ergodicity” JFA 2017 (see on this Webpage).